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Claims

1. An arrangement for Transmission Control Protocol (TCP) flow control in a communication system, the
5 arrangement comprising:
 - means for determining delay in a transmit buffer of the system; and
 - means for modifying TCP window size dependent on the determined delay.
- 10 2. The arrangement of claim 1 wherein the means for modifying TCP window size comprises:
 - means for sending to a TCP server of the system in an acknowledge packet an indication of modified TCP
15 window size.
3. The arrangement of claim 1 or 2 wherein the means for modifying TCP window size comprises:
 - means for determining a new TCP window size as a
20 function of the determined transmit buffer delay, a target transmit buffer delay, and a previously determined TCP window size.
4. The arrangement of claim 3 wherein the function is
25 also a function of control loop gain.
5. The arrangement of any one of claims 1-4 arranged to make, following a change in TCP window size, no further changes until receipt of a number of acknowledge packets
30 substantially equal to half the current number data units in the system.

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6. The arrangement of any one of claims 1-4 wherein the means for determining delay in a transmit buffer of the system comprises:

5 means for determining mean buffer delay of a plurality of data units passing through the transmit buffer and for producing the determined delay as a function of the mean buffer delay.

10 7. The arrangement of claim 6 arranged to modify TCP window size, if the mean buffer delay is within a predetermined range about a target delay, by an amount related to the difference between the mean buffer delay and the target delay.

15 8. The arrangement of claim 7 arranged to modify TCP window size, if the mean buffer delay is outside a predetermined range about a target delay, by an amount related to difference between current mean buffer size and a predetermined value.

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9. The arrangement of any one of claims 1-8 comprised in a network controller of the system.

25 10. The arrangement of any one of claims 1-9 wherein the system comprises a radio communication system.

11. The arrangement of claim 10 wherein the radio communication system comprises a UTRAN system.

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12. A method for Transmission Control Protocol (TCP) flow control in a communication system, the method comprising:

determining delay in a transmit buffer of the system;

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modifying TCP window size dependent on the determined delay.

13. The method of claim 12 wherein the step of modifying TCP window size comprises:

sending to a TCP server of the system in an acknowledge packet an indication of modified TCP window size.

14. The method of claim 12 or 13 wherein the step of modifying TCP window size comprises:

determining a new TCP window size as a function of the determined delay, a target transmit buffer delay, and a previously determined TCP window size.

15. The method of claim 14 wherein the function is also a function of control loop gain.

16. The method of any one of claims 12-15 comprising inhibiting making, following a change in TCP window size, no further changes until receipt of a number of acknowledge packets substantially equal to half the current number data units in the system.

17. The method of any one of claims 12-15 wherein the step of determining delay in a transmit buffer of the system comprises:

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determining mean buffer delay of a plurality of data units passing through the transmit buffer and for producing the determined delay as a function of the mean buffer delay.

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18. The method of claim 17 comprising modifying TCP window size, if the mean buffer delay is within a predetermined range about a target delay, by an amount related to the difference between the mean buffer delay and the target delay.

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19. The method of claim 18 comprising modifying TCP window size, if the mean buffer delay is outside a predetermined range about a target delay, by an amount related to difference between current mean buffer size and a predetermined value.

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20. The method of any one of claims 12-19 performed in a network controller of the system.

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21. The method of any one of claims 12-20 wherein the system comprises a radio communication system.

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22. The method of claim 21 wherein the radio communication system comprises a UTRAN system.

23. A computer program element comprising computer program means for performing substantially the method of any one of claims 12-22.

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24. An integrated circuit comprising the arrangement of any one of claims 1-11.